

**What is Claimed is:**

1. A grid falling film devolatilizer, consisting of a tower housing (1), a liquid distributor (2) and a tower internal (3), wherein the said tower housing has a round, square or rectangle cross section; the said tower internal consists of pillars (3-1) and multiple grid trays (3-2), and four pillars stand respectively at the four corners of the tower internal which has a square or rectangle cross-section; there may be a single one or multiple tower internals arranged parallelly in the tower housing; the number of the grid trays is 2 to 500 and the layer interval between two neighbor grid plate layers is 20 to 500mm; each grid tray comprises a pair of beams (3-2-1), a plurality of grid bars (3-2-2) and corresponding guide members (3-2-3); said beams are located at opposite pair of sides of the grid tray, in a horizontal plane of same height, and are fixed to the pillars; the grid bars are fixed perpendicularly to the beams and are arranged in single tier, double tiers or multiple tiers in a parallel manner; the grid bars have a cross-section of triangle, reverse "V" shape formed by bending thin metal strips, circle or other shapes; said guide members consist of the guide mesh (wires) (3-2-3-1) and the clamp (3-2-3-2) for fixation of the guide mesh (wires), and are disposed at the grid gap between the two neighboring grid bars and parallel to the grid bars, the corresponding clamps are fixed to the beams; the outmost grid bars in a grid tray are formed as inclines or bent strips (3-2-2') which present a larger vertical surface and serve as baffles for keeping liquid level in grid tray; or the clamps of the outmost guide members in a grid tray are extended to be higher than others and serve as baffles for keeping the liquid level in grid tray.
2. A grid falling film devolatilizer according to Claim 1, wherein hangers (3-1-1) are provided on the upper part of the pillars (3-1) and supporting brackets (1-2-1) are provided on the upper part of the tower body (1-2); the hangers are mounted on the supporting brackets and fastened with bolts, so that the tower internal (3) is mounted inside the tower housing; the locating blocks (3-1-2) are provided on the lower part of the pillars and the matching stoppers (1-2-2) are provided on the lower part of the tower body for limiting the swing of the bottom of the tower internal.
3. A grid falling film devolatilizer according to Claim 1, wherein the number of the said multiple grid trays (3-2) is 5 to 200 and the layer interval between two neighboring grid trays is 40 to 250mm.
4. A grid falling film devolatilizer according to Claim 1, wherein the grid bars in two neighboring grid trays are arranged in the following manners: a) arranged in the same direction but staggered by half a film interval; b) cross at 90 degrees; c) a hybrid of a) and b).

5. A grid falling film devolatilizer according to Claim 1, wherein said guide meshes (wires) are woven metal wires, metal sheets, perforated metal sheets, expanded metal meshes, tube array or non-metal meshes; the guide meshes (wires) can be directly fixed below the grids, eliminating the clamps.

6. A grid falling film devolatilizer according to Claim 5, wherein said tube array is formed by joining two corrugated sheets in a face-to-face manner and fixing them with butt welding, and introducing heating or cooling medium thereinto.

7. A grid falling film devolatilizer according to Claim 1, wherein an overflowing film-forming mechanism is employed, in which the clamps are placed at two sides of a grid bar to constitute a grid funnel and the clamps act as overflow weirs.

8. A grid falling film devolatilizer according to Claim 7, wherein a grid bar is disposed above two adjacent clamps that belong to two neighboring grid funnels respectively, and the width of the said grid bar is no less than the interval between the two clamps thereunder; and the grid funnels (or grid bars) in two adjacent grid trays cross at 90 degrees, or alternatively are arranged in the same direction while the grid funnels (or grid bars) are staggered by half an interval of the grid funnel.

9. A grid falling film devolatilizer according to the Claim 7, wherein the grid funnels in two adjacent grid trays are arranged in the same direction but staggered by half an interval of grid funnel. The interval between two adjacent clamps that belong to two neighboring grid funnels is less than the interval between two clamps of a same grid funnel, or the lower portion of two neighboring guide meshes (wires) that belong to two neighboring grid funnels lean toward each other.

10. A grid falling film devolatilizer according to Claim 1, wherein the grid bars in the grid trays are arranged in such a manner that width of grid gaps in said grid trays are gradually increased from top to bottom.